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EPA
United States
Environmental Protection
Agency

December 1, 2011

MEMORANDUM

SUBJECT: **Ecological Risk Assessment for Terbutryn, a new active ingredient. The proposed registration of this product is as an industrial microbiocide for use in joint cements, architectural coatings and OEM industrial coatings, sealants and stuccos.**
DP Barcode: D371450

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12/1/11

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I. INTRODUCTION

The Risk Assessment and Science Support Branch (RASSB) has reviewed Troy Chemical Company's request to obtain a section 3 registration for Terbutryn. The chemical will be used as a materials preservative to control microorganisms in joint cements, architectural coatings and OEM industrial coatings, sealants and stuccos. Terbutryn was initially registered by EPA in 1969 as an herbicide to control weeds in various grain crops, e.g. wheat, barley and sorghum. All registrations in the US were canceled in 1990/1991. The registrants decided to voluntarily cancel their registrations instead of developing new data to fulfill the new FIFRA 88 data requirements. RASSB has five eco-toxicity studies from the original herbicide registration that has been cancelled. These studies will be included in the risk assessment of this new registration for Terbutryn.

Based on the use pattern of Terbutryn, the chemical is not expected to result in adverse acute or chronic risk to terrestrial birds, mammals, or plants; or to aquatic species under

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typical use conditions due to a lack of exposure based on being used as an additive for joint cements, masonry coatings, paint, roof coatings, sealants, stuccos, plastics (vinyl, PIB) and wood protective stains. An endangered species determination will not be made at this time. No additional ecological testing will be necessary.

ECOTOXICITY

Acute Eco-toxicity Studies:

No studies were submitted by the registrant. Five studies were found in the files from the previous registration of Terbutryn as an herbicide. These studies are summarized in the following table.

STUDY TYPE	AUTHORS	RESULTS	CLASSIFICATION
Acute Toxicity to the water flea *Daphnia magna* (850.1010)	S. Leigh UnionCarbide Environmental Services	48-hour EC50 = 2.66 mg/l, 48-hour NOEC = < 0.56 mg/l	Moderately toxic
Acute Toxicity to bluegill (*Lepomis macrochirus*) (850.1075)	G.A. LeBlanc EG&G Bionomics Aquatic Toxicology Laboratory	96-hour LC50 = 1.3 mg/l (0.47-3.6) 96-hour NOEC = < 0.47 mg/l	Moderately toxic
Acute Oral Toxicity Test (LD50) with northern bobwhite (850.2100)	G.L.Jackson Industrial Bio-Test Laboratories, Inc.	LD50 = >5620 ppm	Practically nontoxic
Acute toxicity to rainbowtrout (*Salmo gairdneri*) (850.1075)	G.A.LeBlanc EG&G Bionomics Aquatic Toxicology Laboratory	96-hour LC50 = 1.1 mg/l (0.78-1.3) 96-hour NOEC = < 0.96 mg/l	Moderately toxic
Acute Oral LC50 in the Mallard Duck (*Anas platyrhynchos*) (850.2100)	J.B Beavers Wildlife International, Ltd.	LD50 = >4640 mg/kg	Practically nontoxic

All five studies could be used in a risk assessment. The results demonstrated that the tested chemical, Terbutryn, was practically nontoxic to mallard duck and northern bobwhite quail on an acute basis. The chemical was acutely moderately toxic to bluegill, rainbow trout and daphnia magna.

II. ESTMATED ENVIRONMENTAL CONCENTRATIONS (EECs)

A. EECs – TERRESTRIAL

Terrestrial EECs were not calculated since it is anticipated that exposures and risks for terrestrial animals (birds and mammals) to Terbutryn use should be minimal, and any incidental exposure would be practically non-toxic on an acute basis. Terrestrial plants are also not expected to be at risk.

B. EECs – AQUATIC

Aquatic EECs were not calculated since it is anticipated that exposures and risks for aquatic organisms to Terbutryn use should be minimal, and any incidental exposure would be moderately toxic on an acute basis.

III. RISK QUOTIENTS (RQs) AND LEVELS OF CONCERN (LOCs)

A. OVERVIEW

Exposure and Risk to Nontarget Terrestrial Animals and Aquatic Organisms

Risk characterization integrates the results of the exposure and eco-toxicity data to evaluate the likelihood of adverse ecological effects. The means of this integration is called the quotient method. Risk quotients (RQs) are calculated by dividing exposure estimates by acute and chronic eco-toxicity values.

RQ = EXPOSURE/TOXICITY

RQs are then compared to OPP's levels of concern (LOCs). These LOCs are used by OPP to analyze potential risk to nontarget organisms and the need to consider regulatory action. The criteria indicate that a pesticide used as directed has the potential to cause adverse effects on nontarget organisms. LOCs currently address the following risk presumption categories: (1) **acute** -- potential for acute risk to non-target organisms which may warrant regulatory action in addition to restricted use classification, (2) **acute restricted use** -- the potential for acute risk to non-target organisms, but may be mitigated through restricted use classification, (3) **acute endangered species** - endangered species may be adversely affected by use, (4) **chronic risk** - the potential for chronic risk may warrant regulatory action, endangered species may potentially be affected through chronic exposure, (5) **non-endangered plant risk** – potential for effects in non-target plants, and (6) **endangered plant risk** – potential for effects in endangered plants. Currently, AD does not perform assessments for chronic risk to plants, acute or chronic risks to nontarget insects, or chronic risk from granular/bait formulations to birds or mammals.

The eco-toxicity test values (measurement endpoints) used in the acute and chronic risk quotients are derived from required studies. Examples of eco-toxicity values derived from short-term laboratory studies that assess acute effects are: (1) LC_{50} (fish and birds), (2) LD_{50} (birds and mammals), (3) EC_{50} (aquatic plants and aquatic invertebrates) and (4) EC_{25} (terrestrial plants). Examples of toxicity test effect levels derived from the results of long-term laboratory studies that assess chronic effects are: (1) LOAEC (birds, fish, and aquatic invertebrates), and (2) NOAEC (birds, fish and aquatic invertebrates). For birds and mammals, the NOAEC generally is used as the eco-toxicity test value in assessing chronic effects, although other values may be used when justified. However, the NOAEC is used if the measurement endpoint is production of offspring or survival.

Risk presumptions and the corresponding RQs and LOCs are tabulated below.

Table 3. Risk Presumption Categories

Risk Presumption for Terrestrial Animals	**LOC**
Acute: Potential for acute risk for all non-target organisms	>0.5
Acute Restricted Use: Potential for acute risk for all non-target organisms, but may be mitigated through restricted use classification	>0.2
Acute Endangered Species: endangered species may be adversely affected by use	>0.1
Chronic Risk: potential for chronic risk may warrant regulatory action	>1
Risk Presumption for Aquatic Organisms	**LOC**
Acute: Potential for acute risk for all non-target organisms	>0.5
Acute Restricted Use: Potential for acute risk for all non-target organisms, but may be mitigated through restricted use classification	>0.1
Acute Endangered Species: endangered species may be adversely affected by use	>0.05
Chronic Risk: potential for chronic risk may warrant regulatory action	>1
Risk Presumption for Terrestrial and Aquatic Plants	**LOC**
Potential for risk for all non-endangered and endangered plants	>1

B. RQs – TERRESTRIAL

Terrestrial RQs were not calculated since RASSB believes that exposures and risks for terrestrial animals (birds and mammals) to Terbutryn during use as a materials preservative should be minimal.

C. RQs – AQUATIC

Aquatic RQs were not calculated since RASSB believes that exposures and risks for aquatic organisms to Terbutryn during use as a materials preservative should be minimal.

IV. LISTED SPECIES AND CRITICAL HABITAT REVIEW

Section 7 of the Endangered Species Act, 16 U.S.C. Section 1536(a)(2), requires all federal agencies to consult with the National Marine Fisheries Service (NMFS) for marine and anadromous listed species, or the United States Fish and Wildlife Services (FWS) for listed wildlife and freshwater organisms, if they are proposing an "action" that may affect listed species or their designated habitat. Each federal agency is required under the Act to insure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. To jeopardize the continued existence of a listed species means "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of the species." **50 C.F.R. ' 402.02**.

To facilitate compliance with the requirements of the Endangered Species Act subsection (a)(2) the Environmental Protection Agency, Office of Pesticide Programs has established procedures to evaluate whether a proposed registration action may directly or indirectly reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of any listed species (U.S. EPA 2004). After the Agency's screening-level risk assessment is performed, if any of the Agency's Listed Species LOC Criteria are exceeded for either direct or indirect effects, a determination is made to identify if any listed or candidate species may co-occur in the area of the proposed pesticide use. If determined that listed or candidate species may be present in the proposed use areas, further biological assessment is undertaken. The extent to which listed species may be at risk then determines the need for the development of a more comprehensive consultation package as required by the Endangered Species Act.

This preliminary assessment indicates that there is not a potential for Terbutryn to overlap with listed species and that a more refined assessment is not warranted. An endangered species effect determination will not be made at this time.

V. SUMMARY

In summary, RASSB concludes that based on the available information and data, Terbutryn is not expected to come into contact with non-target species. Terbutryn is used as a material preservative for a number of cements, paints, sealants, stuccos, and coatings, and would not come into contact with non-target organisms. Therefore, no additional testing would be required for this chemical.

VI. ADDITIONAL DATA NEEDED TO REFINE THE ASSESSMENT

No additional data is needed.

VII. LABEL ISSUES:

No additional label statements are necessary

REFERENCES

MRID 00073006 – Beaver, J.B. 1977. "Acute oral LD50 of Terbutyrn Technical in the Mallard Duck." Project number: 108-132. Unpublished study prepared by Wildlife International, Ltd. 9p.

MRID 00139440 – Leigh S. 1977. "Aquatic Toxicity to *Daphnia magna*." Project number: 11506-04-02. Unpublished study prepared by Union Carbide Environmental Services. 7p.

MRID 00041934 - Jackson, G.L. 1968. "Acute Oral Toxicity (LD50) with northern bobwhite (*Colimus virginiamus)*. IBT Number: J6199 . Unpublished study prepared by Industrial Bio-Test laboratories, Inc.. 13p.

MRID 40060802– LeBlanc, G.A. 1982. "Acute toxicity of Terbutryn to Bluegill (*Lepomis macrochirus)*." Study number: BW-82-8-1240. Unpublished study prepared by EG&G Bionomics, Aquatic Toxicology Laboratory. 17p.

MRID 40060803– LeBlanc, G.A. 1982. "Acute toxicity of Terbutryn to rainbow trout (*Salmo gairdneri)*." Study number: BW-82-8-1241. Unpublished study prepared by EG&G Bionomics, Aquatic Toxicology Laboratory. 17p.

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